UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7001

CASCADE STREET

OVER THE

OTTER TAIL RIVER

DISTRICT 4 - OTTER TAIL COUNTY, CITY OF FERGUS FALLS

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 60)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 7001, the Center Pier and the North and South Abutments, were found to be in good to satisfactory condition. The Center Pier exhibited moderate scaling on the upstream and downstream columns. The South Abutment also exhibited moderate scaling along the downstream quarter point of its wall. The channel bottom appeared stable with no significant scour. Since the last inspection there has been aggregation of bottom material such that the Center Pier footings are no longer exposed.

INSPECTION FINDINGS:

(A) The concrete surfaces of the Center Pier and the North and South Abutments were smooth and sound with random minor areas of poor consolidation up to ½ inch penetration.

(B) The downstream quarter point of the South Abutment exhibited moderate scaling from 1 foot above the waterline to the channel bottom with up to ½ inch of penetration.

(C) A band of scaling, 1 foot high by 3 feet long and ½ inch deep, was observed at the waterline on both the upstream and downstream columns where the columns meets the pier cap on both sides of the Center Pier.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 7001

Feature Crossed: Otter Tail River

Feature Carried: Cascade Street

Location: District 4 - Otter Tail County, City of Fergus Falls

Bridge Description: The Bridge consists of a two span, multiple steel stringer superstructure supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and one reinforced concrete pier. The footings of the pier and both abutments are founded on untreated timber piles. The bridge is oriented in a north-south direction.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 22, 2007

Weather Conditions: Sunny, 75°F

Underwater Visibility: 5.0 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Abutments and the Center Pier

General Shape: The Center Pier consists of a rectangular cap with partially tapered ends supported by three hexagonal shafts. Each shaft has its own rectangular footing. The South and North Abutments are each closed, full-height, counterfort stems with rectangular footings. All of the footings are founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 10.4 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the east end of the Center Pier.

Water Surface: The waterline was approximately 3.2 feet below reference. Waterline Elevation = 1180.8.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code N/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

Photograph 1. Overall View of the Structure, Looking East.

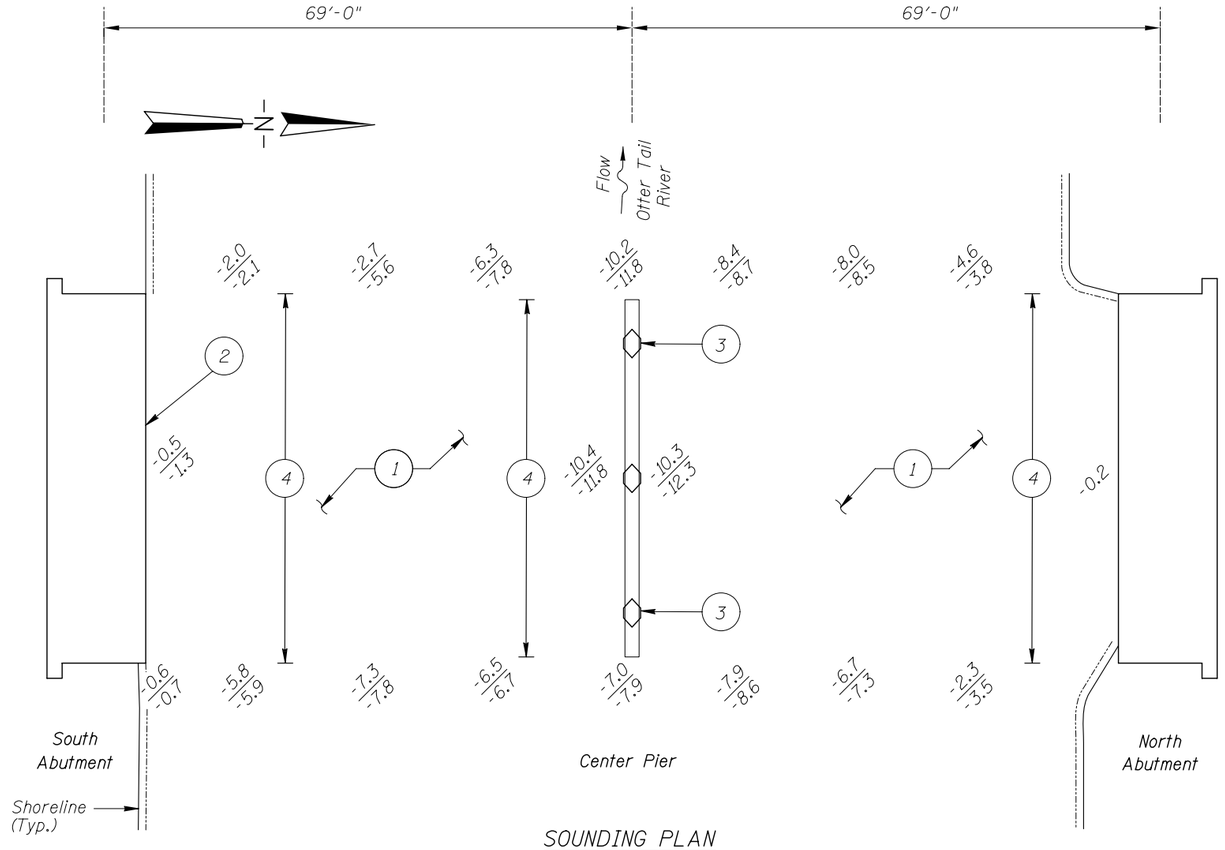

Photograph 2. View of North Abutment, Looking East.

Photograph 3. View of Center Pier, Looking Southeast.

Photograph 4. View of Downstream End of the Center Pier, Looking South.

Photograph 5. View of Upstream End of the Center Pier, Looking South.

Photograph 6. View of South Abutment, Looking East.



SOUNDING PLAN

GENERAL NOTES:

1. The North and South Abutments and Center Pier were inspected underwater.
2. At the time of inspection on August 22, 2007, the waterline was located approximately 3.2 feet below the top of the pier cap at the upstream end of the Center Pier. This corresponds with a waterline elevation of 1180.8.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure unit.

INSPECTION NOTES:

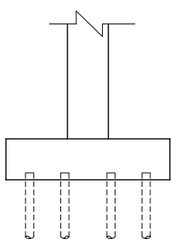
(1) The channel bottom consisted of sandy gravel with scattered riprap up to 3 feet in diameter with a probe rod penetration of up to 3 inches.

(2) The downstream 1/4 point of the South Abutment exhibited moderate scaling from 1 foot above the waterline to the channel bottom with up to 1/2 inch of penetration. The abutment also exhibited minor areas of poor consolidation up to 1/2 inch penetration.

(3) A band of scaling 1 foot high, 3 feet long and 1/2 inch deep was observed at the waterline on both the upstream and downstream columns. Areas were located where the columns meet the pier cap on both sides of the Center Pier.

(4) Concrete was smooth and sound with minor areas of poor cosolidation up to 1/2 inch penetration.

NOTE: Bridge was undergoing repairs at the time of inspection. Superstructure is new and substructure was rehabilitated.



TYPICAL END VIEW OF PIERS

Legend

-2.0 Sounding Depth (8/22/07)
-5.2 Sounding Depth (10/30/02)

Timber Debris

Note:

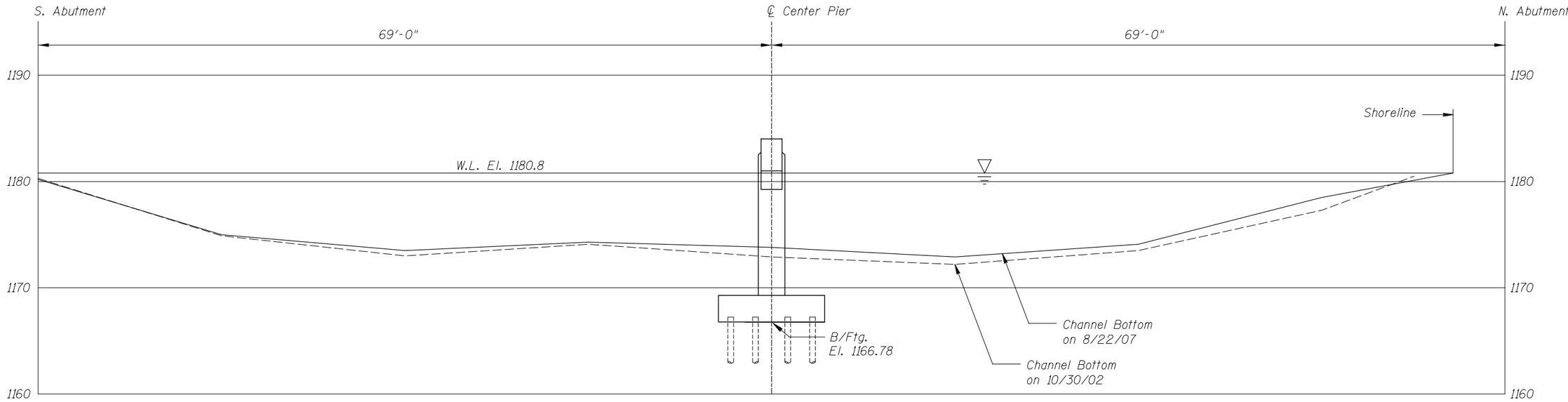
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

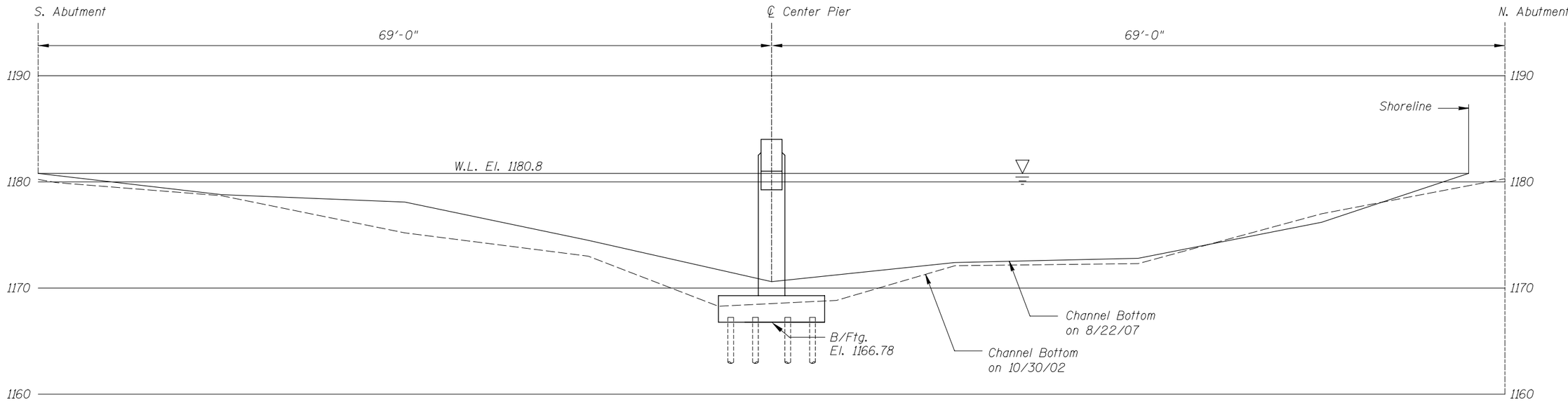
STRUCTURE NO. 7001
OVER THE OTTER TAIL RIVER
DISTRICT 4, OTTER TAIL COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-0300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=10'-0"
Code: 52210060		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
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UNDERWATER BRIDGE INSPECTION

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DISTRICT 4, OTTER TAIL COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=10'
Code: 52210060		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 22, 2007
ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.
BRIDGE NO: 7001 WEATHER: Sunny, 75°F
WATERWAY CROSSED: Otter Tail River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: John J. Loftus, Valerie Roustan
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 11:40 a.m.
TIME OUT OF WATER: 12:10 p.m.
WATERWAY DATA: VELOCITY 1.0 f.p.s.
VISIBILITY 5.0 feet
DEPTH 10.4 feet maximum at the Center Pier
ELEMENTS INSPECTED: North and South Abutments, and Center Pier
REMARKS: Overall, the concrete surfaces of the Center Pier and the North and South Abutments were smooth and sound with minor areas of poor consolidation having up to ½ inch penetration. A band of scaling, 1 foot high by 3 feet long and ½ inch deep was observed at the waterline on both the upstream and downstream columns of the Center Pier. The areas are where the columns meet the pier cap on both sides of the Center Pier. The downstream quarter point of the South Abutment exhibited moderate scaling from 1 foot above the waterline to the channel bottom with up to ½ inch penetration. The prior exposure of the Center Pier footings no longer exists.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

Note: Bridge was undergoing repairs at the time of inspection. Superstructure is new and Substructure was rehabilitated.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7001
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Otter Tail River

INSPECTION DATE August 22, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR (FOOTING EXPOSURE)	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	North Abutment	0.2’	N	7	N	9	N	7	7	7	7	N	7	7	N	N	N	N	N
	Center Pier	10.4’	N	6	N	9	N	6	7	N	N	N	7	7	N	N	N	8	N
	South Abutment	0.6’	N	6	N	9	N	6	7	7	7	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete surfaces of the Center Pier and the North and South Abutments were smooth and sound with minor areas of poor consolidation having up to ½ inch penetration. A band of scaling, 1 foot high by 3 feet long and ½ inch deep was observed at the waterline on both the upstream and downstream columns of the Center Pier. The areas are where the columns meet the pier cap on both sides of the Center Pier. The downstream quarter point of the South Abutment exhibited moderate scaling from 1 foot above the waterline to the channel bottom with up to ½ inch penetration. The prior exposure of the Center Pier footings no longer exists.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.